



85										90					95					
ccc	cg	agc	ttc	gcc	gag	ctt	cgg	ggg	ctt	ctt	ggt	ctc	ggg	cc	tac	336				
Pro	Pro	Ser	Phe	Ala	Glu	Leu	Arg	Gly	Leu	Pro	Gly	Leu	Gly	Pro	Tyr					
100										105					110					
acc	gcg	gcg	gcg	gtg	gcc	tcc	atc	gcc	ttc	ggg	gag	cgg	gtg	gcg	gcg	384				
Thr	Ala	Ala	Ala	Val	Ala	Ser	Ile	Ala	Phe	Gly	Glu	Arg	Val	Ala	Ala					
115										120					125					
gtg	gac	ggg	aac	gtc	cgg	agg	gtc	ctc	tcc	cgc	ctc	ttc	gcc	cgg	gaa	432				
Val	Asp	Gly	Asn	Val	Arg	Arg	Val	Leu	Ser	Arg	Leu	Phe	Ala	Arg	Glu					
130										135					140					
agc	ccc	aag	gag	aag	gag	ctt	ttc	gcc	ctc	gcc	cag	ggc	ctc	ctc	ccc	480				
Ser	Pro	Lys	Glu	Lys	Glu	Leu	Phe	Ala	Leu	Ala	Gln	Gly	Leu	Leu	Pro					
145										150					155					160
gag	ggc	gtg	gac	ccg	ggg	gtg	tgg	aac	cag	gcc	ctc	atg	gag	ctc	ggg	528				
Glu	Gly	Val	Asp	Pro	Gly	Val	Trp	Asn	Gln	Ala	Leu	Met	Glu	Leu	Gly					
165										170					175					
gcc	acg	gtc	tgc	ctg	ccg	aaa	cgg	ccc	cgt	tgc	ggg	gcc	tgc	ccc	cta	576				
Ala	Thr	Val	Cys	Leu	Pro	Lys	Arg	Pro	Arg	Cys	Gly	Ala	Cys	Pro	Leu					
180										185					190					
ggg	gcc	ttc	tgc	cgg	ggg	aag	gag	gcc	ccc	ggg	cgc	tac	ccc	gcg	ccc	624				
Gly	Ala	Phe	Cys	Arg	Gly	Lys	Glu	Ala	Pro	Gly	Arg	Tyr	Pro	Ala	Pro					
195										200					205					
agg	aag	cgc	cgg	gcg	aag	gag	gag	cgc	ctc	gtc	gcc	ctc	gtc	ctc	ctc	672				
Arg	Lys	Arg	Arg	Ala	Lys	Glu	Glu	Arg	Leu	Val	Ala	Leu	Val	Leu	Leu					
210										215					220					
ggg	cgg	aag	ggg	gtg	cac	ctg	gaa	agg	ctt	gag	ggg	cgc	ttc	cag	ggc	720				
Gly	Arg	Lys	Gly	Val	His	Leu	Glu	Arg	Leu	Glu	Gly	Arg	Phe	Gln	Gly					
225										230					235					240
ctc	tac	ggc	gtc	ccc	ctc	ttt	ccc	ctt	gag	gag	ctt	ccc	ggg	cgg	gag	768				
Leu	Tyr	Gly	Val	Pro	Leu	Phe	Pro	Pro	Glu	Glu	Leu	Pro	Gly	Arg	Glu					
245										250					255					
gcg	gcc	ttc	ggg	gtg	agg	tct	agg	ccc	cta	ggc	gag	gtg	cgc	cac	gcc	816				
Ala	Ala	Phe	Gly	Val	Arg	Ser	Arg	Pro	Leu	Gly	Glu	Val	Arg	His	Ala					
260										265					270					
ctc	acc	cac	cgg	agg	ctt	cgc	gtg	gag	gtg	cgg	ggg	gcc	ctt	tgg	gaa	864				
Leu	Thr	His	Arg	Arg	Leu	Arg	Val	Glu	Val	Arg	Gly	Ala	Leu	Trp	Glu					
275										280					285					
ggg	gag	ggg	gag	gac	ccc	tgg	aag	agg	ccc	cta	ccc	aag	ctc	atg	gag	912				

Gly Glu Gly Glu Asp Pro Trp Lys Arg Pro Leu Pro Lys Leu Met Glu  
 290 295 300

aag gtc ctc cgc aag gcg ctt ccc ctc ctc gct cat gcg ggc gta gtc 960  
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ccc ctc ccg gac gca 975  
 Pro Leu Pro Asp Ala  
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 35 40 45

Tyr Arg Arg Phe Leu Glu Arg Phe Pro Thr Leu Lys Ala Leu Ala Ala  
 50 55 60

Ala Ser Leu Glu Glu Val Leu Arg Val Trp Gln Gly Ala Gly Tyr Tyr  
 65 70 75 80

Arg Arg Ala Glu His Leu His Arg Leu Ala Arg Ser Val Glu Glu Leu  
 85 90 95

Pro Pro Ser Phe Ala Glu Leu Arg Gly Leu Pro Gly Leu Gly Pro Tyr  
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Thr Ala Ala Ala Val Ala Ser Ile Ala Phe Gly Glu Arg Val Ala Ala  
 115 120 125

Val Asp Gly Asn Val Arg Arg Val Leu Ser Arg Leu Phe Ala Arg Glu  
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Ser Pro Lys Glu Lys Glu Leu Phe Ala Leu Ala Gln Gly Leu Leu Pro  
 145 150 155 160

Glu Gly Val Asp Pro Gly Val Trp Asn Gln Ala Leu Met Glu Leu Gly  
 165 170 175

Ala Thr Val Cys Leu Pro Lys Arg Pro Arg Cys Gly Ala Cys Pro Leu  
180 185 190

Gly Ala Phe Cys Arg Gly Lys Glu Ala Pro Gly Arg Tyr Pro Ala Pro  
195 200 205

Arg Lys Arg Arg Ala Lys Glu Glu Arg Leu Val Ala Leu Val Leu Leu  
210 215 220

Gly Arg Lys Gly Val His Leu Glu Arg Leu Glu Gly Arg Phe Gln Gly  
225 230 235 240

Leu Tyr Gly Val Pro Leu Phe Pro Pro Glu Glu Leu Pro Gly Arg Glu  
245 250 255

Ala Ala Phe Gly Val Arg Ser Arg Pro Leu Gly Glu Val Arg His Ala  
260 265 270

Leu Thr His Arg Arg Leu Arg Val Glu Val Arg Gly Ala Leu Trp Glu  
275 280 285

Gly Glu Gly Glu Asp Pro Trp Lys Arg Pro Leu Pro Lys Leu Met Glu  
290 295 300

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Pro Leu Pro Asp Ala  
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<211> 1998

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<213> *Thermus thermophilus*

<220>

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cag tgg cgg gag gtg atg gcg gcc ttg gag gtg ggg ccg gag gcc gcc 96  
Gln Trp Arg Glu Val Met Ala Ala Leu Glu Val Gly Pro Glu Ala Ala  
20 25 30

ctg gcc tac tgg cac cgg ggc ttt agg cgc aag gag gac ctg gac ccc 144  
Leu Ala Tyr Trp His Arg Gly Phe Arg Arg Lys Glu Asp Leu Asp Pro

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ccc	ctc	gcc	ctc	ctt	ccc	ctc	aag	ggc	ctg	agg	gag	gcg	gcg	gcc	ctc	192
Pro	Leu	Ala	Leu	Leu	Pro	Leu	Lys	Gly	Leu	Arg	Glu	Ala	Ala	Ala	Leu	
50					55					60						
ctg	gag	gag	gcg	ctc	cgc	cag	ggg	aag	cgg	atc	cgc	gtc	cac	ggg	gac	240
Leu	Glu	Glu	Ala	Leu	Arg	Gln	Gly	Lys	Arg	Ile	Arg	Val	His	Gly	Asp	
65					70					75					80	
tac	gac	gcc	gac	ggg	ctc	acg	ggc	acg	gcc	atc	ctg	gtt	cgg	ggc	ctc	288
Tyr	Asp	Ala	Asp	Gly	Leu	Thr	Gly	Thr	Ala	Ile	Leu	Val	Arg	Gly	Leu	
85					90					95						
gcc	gcc	ttg	ggc	gcc	gac	gtc	cac	ccc	ttc	atc	ccc	cac	cgg	ctg	gag	336
Ala	Ala	Leu	Gly	Ala	Asp	Val	His	Pro	Phe	Ile	Pro	His	Arg	Leu	Glu	
100					105					110						
gaa	ggg	tac	ggg	gtg	ctg	atg	gag	cgg	gtt	ccc	gag	cac	ctc	gag	gcc	384
Glu	Gly	Tyr	Gly	Val	Leu	Met	Glu	Arg	Val	Pro	Glu	His	Leu	Glu	Ala	
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tcg	gac	ctc	ttc	ctc	acc	gtg	gac	tgc	ggg	atc	acg	aac	cac	gcc	gag	432
Ser	Asp	Leu	Phe	Leu	Thr	Val	Asp	Cys	Gly	Ile	Thr	Asn	His	Ala	Glu	
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ctc	agg	gag	ctt	ttg	gaa	aac	ggg	gtg	gag	gtg	atc	gtc	acc	gac	cac	480
Leu	Arg	Glu	Leu	Leu	Glu	Asn	Gly	Val	Glu	Val	Ile	Val	Thr	Asp	His	
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cac	acc	ccc	ggc	aag	acc	ctt	tcc	ccc	ggc	ctc	gtg	gtc	cac	ccc	gcc	528
His	Thr	Pro	Gly	Lys	Thr	Pro	Ser	Pro	Gly	Leu	Val	Val	His	Pro	Ala	
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ctc	acc	ccg	gac	ctt	aag	gag	aag	ccc	acg	ggg	gcg	ggg	gtg	gtc	ttc	576
Leu	Thr	Pro	Asp	Leu	Lys	Glu	Lys	Pro	Thr	Gly	Ala	Gly	Val	Val	Phe	
180					185					190						
ctc	ctc	ctc	tgg	gcc	ctc	cac	gag	cgc	ctg	ggc	ctt	ccc	cca	ccc	ctg	624
Leu	Leu	Leu	Trp	Ala	Leu	His	Glu	Arg	Leu	Gly	Leu	Pro	Pro	Pro	Leu	
195					200					205						
gag	tac	gcc	gac	ctc	gcc	gcg	gtg	ggc	acc	atc	gcc	gac	gtg	gcc	ccc	672
Glu	Tyr	Ala	Asp	Leu	Ala	Ala	Val	Gly	Thr	Ile	Ala	Asp	Val	Ala	Pro	
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ctt	tgg	ggc	tgg	aac	cgg	gcc	ttg	gtg	aag	gag	ggc	ctg	gcc	cgc	atc	720
Leu	Trp	Gly	Trp	Asn	Arg	Ala	Leu	Val	Lys	Glu	Gly	Leu	Ala	Arg	Ile	
225					230					235					240	
ccc	gcc	tcc	tcc	tgg	gtt	ggg	ctc	agg	ctt	ctg	gcc	gag	gcg	gtg	ggg	768

Pro Ala Ser Ser Trp Val Gly Leu Arg Leu Leu Ala Glu Ala Val Gly	
245	250
255	
tac acg ggg aag gcg gtg gag gtg gcc ttc cgc atc gcc ccc cgg atc	816
Tyr Thr Gly Lys Ala Val Glu Val Ala Phe Arg Ile Ala Pro Arg Ile	
260	265
270	
aac gcg gca agc cgc ctc ggg gag gct gag aag gcc cta agg ctc ctc	864
Asn Ala Ala Ser Arg Leu Gly Glu Ala Glu Lys Ala Leu Arg Leu Leu	
275	280
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ctc acc gac gac gcg gcc gag gcc cag gcc ctc gtg ggg gaa ctc cac	912
Leu Thr Asp Asp Ala Ala Glu Ala Gln Ala Leu Val Gly Glu Leu His	
290	295
300	
cgg ctg aac gcc cgc cgc cag acc ctg gag gag gcc atg ctc agg aag	960
Arg Leu Asn Ala Arg Arg Gln Thr Leu Glu Glu Ala Met Leu Arg Lys	
305	310
315	320
ctc ctc ccc cag gcg gac ccc gag gcc aag gcc atc gtc ctc ctg gac	1008
Leu Leu Pro Gln Ala Asp Pro Glu Ala Lys Ala Ile Val Leu Leu Asp	
325	330
335	
ccc gag ggg cac cgg ggg gtg atg ggc atc gtg gcg agc cgc atc ctg	1056
Pro Glu Gly His Pro Gly Val Met Gly Ile Val Ala Ser Arg Ile Leu	
340	345
350	
gag gcc acc ctc cgg ccc gtc ttc ctg gtg gcc cag ggc aag ggg acg	1104
Glu Ala Thr Leu Arg Pro Val Phe Leu Val Ala Gln Gly Lys Gly Thr	
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365	
gtg cgg agc ctc gcc ccc atc agc gcc gtg gag gcc cta agg agc gcc	1152
Val Arg Ser Leu Ala Pro Ile Ser Ala Val Glu Ala Leu Arg Ser Ala	
370	375
380	
gag gac ctt ttg ttg cgc tac ggg ggg cac aag gag gcg gcg ggc ttc	1200
Glu Asp Leu Leu Leu Arg Tyr Gly Gly His Lys Glu Ala Ala Gly Phe	
385	390
395	400
gcc atg gac gag gcc ctc ttc ccc gcc ttc aag gcc cgg gtg gag gcc	1248
Ala Met Asp Glu Ala Leu Phe Pro Ala Phe Lys Ala Arg Val Glu Ala	
405	410
415	
tac gcc gcc cgc ttc ccc gac ccc gtg cgc gag gtg gcc ctt ttg gac	1296
Tyr Ala Ala Arg Phe Pro Asp Pro Val Arg Glu Val Ala Leu Leu Asp	
420	425
430	
ctg ctt cgg gag ccc ggc ctc ctc ccc cag gtc ttc cgg gag ctc gcc	1344
Leu Leu Pro Glu Pro Gly Leu Leu Pro Gln Val Phe Arg Glu Leu Ala	
435	440
445	

c	t	t	g	g	c	c	t	a	c	g	g	g	a	a	c	c	g	c	c	t	t	c	c	c		1392
Leu	Leu	Glu	Pro	Tyr	Gly	Glu	Gly	Asn	Pro	Glu	Pro	Leu	Phe	Leu	Leu											
450						455				460																
t	t	g	c	c	g	g	c	c	c	g	g	g	c	c	c	g	c	c	c	t	t	c	c	c		1440
Phe	Gly	Ala	Pro	Glu	Glu	Ala	Arg	Arg	Leu	Gly	Glu	Gly	Arg	His	Leu											
465					470				475					480												
g	c	c	c	t	a	g	g	g	t	c	g	t	a	a	c	g	g	g	g							1488
Ala	Phe	Arg	Leu	Lys	Gly	Val	Arg	Val	Leu	Ala	Trp	Lys	Gln	Gly	Asp											
				485				490					495													
c	g	c	c	c	c	g	g	t	g	g	c	c	c	a	g	g	a	a								1536
Leu	Ala	Leu	Pro	Pro	Glu	Val	Glu	Val	Ala	Gly	Leu	Leu	Ser	Glu	Asn											
			500				505						510													
g	t	a	g	c	c	t	g	t	g	c	c	g	g	t	c	c	a									1584
Ala	Trp	Asn	Gly	His	Leu	Ala	Tyr	Glu	Val	Gln	Ala	Val	Asp	Leu	Arg											
		515				520				525																
a	g	c	g	c	c	g	g	a	c	c	t	g	c	t	c	c	c	t								1632
Lys	Pro	Glu	Ala	Ala	Glu	Gly	Gly	Ile	Ala	Pro	Phe	Ala	Tyr	Pro	Leu											
		530			535			540																		
c	c	c	g	g	c	c	c	c	c	c	g	g	a	g	g	t	t									1680
Pro	Leu	Leu	Glu	Ala	Leu	Ala	Arg	Ala	Arg	Leu	Gly	Glu	Gly	Val	Tyr											
545				550				555						560												
g	c	g	g	a	c	g	g	c	t	a	g	c	a	a	g	c	g									1728
Val	Pro	Glu	Asp	Asn	Pro	Glu	Gly	Leu	Asp	Tyr	Ala	Arg	Lys	Ala	Gly											
			565				570						575													
t	c	c	c	c	c	g	g	c	g	c	t	g	c	g	c	c										1776
Phe	Arg	Leu	Leu	Pro	Pro	Glu	Glu	Ala	Gly	Leu	Trp	Leu	Gly	Leu	Pro											
			580				585						590													
c	a	g	c	g	c	g	a	g	g	t	g	c	g	c	g	g										1824
Pro	Arg	Pro	Val	Leu	Gly	Arg	Arg	Val	Glu	Val</																

aac cgt gla cag gag ccc gcg gga agc cca  
 Asn Arg Val Gln Glu Pro Ala Gly Ser Pro  
 660 665

1998

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 Met Arg Asp Arg Val Arg Trp Arg Val Leu Ser Leu Pro Pro Leu Ala  
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Gln Trp Arg Glu Val Met Ala Ala Leu Glu Val Gly Pro Glu Ala Ala  
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Leu Ala Tyr Trp His Arg Gly Phe Arg Arg Lys Glu Asp Leu Asp Pro  
 35 40 45

Pro Leu Ala Leu Leu Pro Leu Lys Gly Leu Arg Glu Ala Ala Ala Leu  
 50 55 60

Leu Glu Glu Ala Leu Arg Gln Gly Lys Arg Ile Arg Val His Gly Asp  
 65 70 75 80

Tyr Asp Ala Asp Gly Leu Thr Gly Thr Ala Ile Leu Val Arg Gly Leu  
 85 90 95

Ala Ala Leu Gly Ala Asp Val His Pro Phe Ile Pro His Arg Leu Glu  
 100 105 110

Glu Gly Tyr Gly Val Leu Met Glu Arg Val Pro Glu His Leu Glu Ala  
 115 120 125

Ser Asp Leu Phe Leu Thr Val Asp Cys Gly Ile Thr Asn His Ala Glu  
 130 135 140

Leu Arg Glu Leu Leu Glu Asn Gly Val Glu Val Ile Val Thr Asp His  
 145 150 155 160

His Thr Pro Gly Lys Thr Pro Ser Pro Gly Leu Val Val His Pro Ala  
 165 170 175

Leu Thr Pro Asp Leu Lys Glu Lys Pro Thr Gly Ala Gly Val Val Phe  
 180 185 190

Leu Leu Leu Trp Ala Leu His Glu Arg Leu Gly Leu Pro Pro Pro Leu  
 195 200 205



Glu Tyr Ala Asp Leu Ala Ala Val Gly Thr Ile Ala Asp Val Ala Pro	210	215	220
Leu Trp Gly Trp Asn Arg Ala Leu Val Lys Glu Gly Leu Ala Arg Ile	225	230	235 240
Pro Ala Ser Ser Trp Val Gly Leu Arg Leu Leu Ala Glu Ala Val Gly	245	250	255
Tyr Thr Gly Lys Ala Val Glu Val Ala Phe Arg Ile Ala Pro Arg Ile	260	265	270
Asn Ala Ala Ser Arg Leu Gly Glu Ala Glu Lys Ala Leu Arg Leu Leu	275	280	285
Leu Thr Asp Asp Ala Ala Glu Ala Gln Ala Leu Val Gly Glu Leu His	290	295	300
Arg Leu Asn Ala Arg Arg Gln Thr Leu Glu Glu Ala Met Leu Arg Lys	305	310	315 320
Leu Leu Pro Gln Ala Asp Pro Glu Ala Lys Ala Ile Val Leu Leu Asp	325	330	335
Pro Glu Gly His Pro Gly Val Met Gly Ile Val Ala Ser Arg Ile Leu	340	345	350
Glu Ala Thr Leu Arg Pro Val Phe Leu Val Ala Gln Gly Lys Gly Thr	355	360	365
Val Arg Ser Leu Ala Pro Ile Ser Ala Val Glu Ala Leu Arg Ser Ala	370	375	380
Glu Asp Leu Leu Leu Arg Tyr Gly Gly His Lys Glu Ala Ala Gly Phe	385	390	395 400
Ala Met Asp Glu Ala Leu Phe Pro Ala Phe Lys Ala Arg Val Glu Ala	405	410	415
Tyr Ala Ala Arg Phe Pro Asp Pro Val Arg Glu Val Ala Leu Leu Asp	420	425	430
Leu Leu Pro Glu Pro Gly Leu Leu Pro Gln Val Phe Arg Glu Leu Ala	435	440	445
Leu Leu Glu Pro Tyr Gly Glu Gly Asn Pro Glu Pro Leu Phe Leu Leu	450	455	460
Phe Gly Ala Pro Glu Glu Ala Arg Arg Leu Gly Glu Gly Arg His Leu	465	470	475 480

Ala Phe Arg Leu Lys Gly Val Arg Val Leu Ala Trp Lys Gln Gly Asp  
                   485                  490                  495

Leu Ala Leu Pro Pro Glu Val Glu Val Ala Gly Leu Leu Ser Glu Asn  
                   500                  505                  510

Ala Trp Asn Gly His Leu Ala Tyr Glu Val Gln Ala Val Asp Leu Arg  
                   515                  520                  525

Lys Pro Glu Ala Leu Glu Gly Gly Ile Ala Pro Phe Ala Tyr Pro Leu  
                   530                  535                  540

Pro Leu Leu Glu Ala Leu Ala Arg Ala Arg Leu Gly Glu Gly Val Tyr  
                   545                  550                  555                  560

Val Pro Glu Asp Asn Pro Glu Gly Leu Asp Tyr Ala Arg Lys Ala Gly  
                   565                  570                  575

Phe Arg Leu Leu Pro Pro Glu Glu Ala Gly Leu Trp Leu Gly Leu Pro  
                   580                  585                  590

Pro Arg Pro Val Leu Gly Arg Arg Val Glu Val Ala Leu Gly Arg Glu  
                   595                  600                  605

Ala Arg Ala Arg Leu Ser Ala Pro Pro Val Leu His Thr Pro Glu Ala  
                   610                  615                  620

Arg Leu Lys Ala Leu Val His Arg Arg Leu Leu Phe Ala Tyr Glu Arg  
                   625                  630                  635                  640

Arg His Pro Gly Leu Phe Ser Glu Ala Leu Leu Ala Tyr Trp Glu Val  
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Asn Arg Val Gln Glu Pro Ala Gly Ser Pro  
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<213> *Thermus thermophilus*

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1

5

10

15

gag gcc tac cgc ccc ccg ccg ggc ctt tcc gcc ctg gtg ggg gcc aac Glu Ala Tyr Arg Pro Pro Pro Gly Leu Ser Ala Leu Val Gly Ala Asn 20 25 30	96
gcc cag ggg aag acg agc ctc ctc ctg ggg atc cac ctg gcc cta ggg Ala Gln Gly Lys Thr Ser Leu Leu Leu Gly Ile His Leu Ala Leu Gly 35 40 45	144
ggg gag gtc ccc ctg ggc ctt gcc gac ctc gtc cgc ttc ggg gag gag Gly Glu Val Pro Leu Gly Leu Ala Asp Leu Val Arg Phe Gly Glu Glu 50 55 60	192
gag gcc tgg ctc cac gcc gag gtg gag acg gag ctc ggg gcc tac cgc Glu Ala Trp Leu His Ala Glu Val Glu Thr Glu Leu Gly Ala Tyr Arg 65 70 75 80	240
ctg gag cac cgc ctg ggc ccc ggg ggg cgg gag gtc ctc ctc aac ggg Leu Glu His Arg Leu Gly Pro Gly Gly Arg Glu Val Leu Leu Asn Gly 85 90 95	288
aag cgg gtg agc ctt cgg acc ctt tgg gag ctt ccc ggc tgc gtc ctc Lys Arg Val Ser Leu Arg Thr Leu Trp Glu Leu Pro Gly Ser Val Leu 100 105 110	336
gtc tcc cct ctg gac ctc gag gcg gtc ctc ggg ccc aag gag gag cgg Val Ser Pro Leu Asp Leu Glu Ala Val Leu Gly Pro Lys Glu Glu Arg 115 120 125	384
cgg gcc tac ctg gac cgg ctc atc gcc cgc ttc tcc cgc cgc tac gcc Arg Ala Tyr Leu Asp Arg Leu Ile Ala Arg Phe Ser Arg Arg Tyr Ala 130 135 140	432
gcc ctc ctt tcc gcc tac gag aag gcg ctg cgc cag cgg aac gcc ctc Ala Leu Leu Ser Ala Tyr Glu Lys Ala Leu Arg Gln Arg Asn Ala Leu 145 150 155 160	480
ctc aag gcc ggg ggg gag ggc ctt tcc gcc tgg gac cgg gag ctc gcc Leu Lys Ala Gly Gly Glu Gly Leu Ser Ala Trp Asp Arg Glu Leu Ala 165 170 175	528
cgc tac ggg gac gag atc gtg gcc ctg agg cgc cgc ttc ctc cgg cgc Arg Tyr Gly Asp Glu Ile Val Ala Leu Arg Arg Arg Phe Leu Arg Arg 180 185 190	576
ttc gcc ccc atc ctg cgg gag gtc cac gcc gcc ctc gcc gcc aag gag Phe Ala Pro Ile Leu Arg Glu Val His Ala Ala Leu Ala Ala Lys Glu 195 200 205	624
gcg ggg ctt cgc ttg gag gag acc gcg ggg gaa ggg gtg ctc cgg gcc Ala Gly Leu Arg Leu Glu Glu Thr Ala Gly Glu Gly Val Leu Arg Ala 210 215 220	672

ctc gag gcc agc cgg gcc gag gag cgg gaa cgg ggc cag acc ctg gtg 720  
 Leu Glu Ala Ser Arg Ala Glu Glu Arg Glu Arg Gly Gln Thr Leu Val  
 225 230 235 240

ggg ccc cac cgg gac gac ctg gtc ttc ctc ctg gag ggg cgg ccc gcc 768  
 Gly Pro His Arg Asp Asp Leu Val Phe Leu Leu Glu Gly Arg Pro Ala  
 245 250 255

cac cgg ttc gcc agc cgc ggg gag gcc aag acc ctg gcc ctg gcc ctg 816  
 His Arg Phe Ala Ser Arg Gly Glu Ala Lys Thr Leu Ala Leu Ala Leu  
 260 265 270

cgc ctc gcc gag cac cgc ctc ctc ggc gag cac cac ggc gag ccc ccc 864  
 Arg Leu Ala Glu His Arg Leu Leu Gly Glu His His Gly Glu Pro Pro  
 275 280 285

ctc ctc ctc gtg gac gag tgg ggg gag gag ctg gac gag gcc cgc agg 912  
 Leu Leu Leu Val Asp Glu Trp Gly Glu Glu Leu Asp Glu Ala Arg Arg  
 290 295 300

cgg gcc gtc ctc gcc tac gcc cag gcc ctg ccc cag gcc atc ctg cgc 960  
 Arg Ala Val Leu Ala Tyr Ala Gln Ala Leu Pro Gln Ala Ile Leu Ala  
 305 310 315 320

ggg ctg gaa gcc ccc ccg ggg gtc ccg gta tgc tgc gtc gta cga ggg 1008  
 Gly Leu Glu Ala Pro Pro Gly Val Pro Val Cys Ser Val Val Arg Gly  
 325 330 335

gtg gtc ctg tgc cct ggc gcc 1029  
 Val Val Leu Cys Pro Gly Ala  
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<210> 6

<211> 343

<212> PRT

<213> *Thermus thermophilus*

<400> 6

Met Arg Leu Leu Leu Phe Arg Gln Arg Asn Phe Arg Asn Leu Ala Leu  
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Glu Ala Tyr Arg Pro Pro Pro Gly Leu Ser Ala Leu Val Gly Ala Asn  
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Ala Gln Gly Lys Thr Ser Leu Leu Leu Gly Ile His Leu Ala Leu Gly  
 35 40 45

Gly Glu Val Pro Leu Gly Leu Ala Asp Leu Val Arg Phe Gly Glu Glu  
 50 55 60

Glu 65	Ala	Trp	Leu	His	Ala	Glu	Val	Glu	Thr	Glu	Leu	Gly	Ala	Tyr	Arg	80
Leu	Glu	His	Arg	Leu	Gly	Pro	Gly	Gly	Arg	Glu	Val	Leu	Leu	Asn	Gly	95
Lys	Arg	Val	Ser	Leu	Arg	Thr	Leu	Trp	Glu	Leu	Pro	Gly	Ser	Val	Leu	100
Val	Ser	Pro	Leu	Asp	Leu	Glu	Ala	Val	Leu	Gly	Pro	Lys	Glu	Glu	Arg	115
Arg	Ala	Tyr	Leu	Asp	Arg	Leu	Ile	Ala	Arg	Phe	Ser	Arg	Arg	Tyr	Ala	130
Ala	Leu	Leu	Ser	Ala	Tyr	Glu	Lys	Ala	Leu	Arg	Gln	Arg	Asn	Ala	Leu	145
Leu	Lys	Ala	Gly	Gly	Glu	Gly	Leu	Ser	Ala	Trp	Asp	Arg	Glu	Leu	Ala	165
Arg	Tyr	Gly	Asp	Glu	Ile	Val	Ala	Leu	Arg	Arg	Arg	Phe	Leu	Arg	Arg	180
Phe	Ala	Pro	Ile	Leu	Arg	Glu	Val	His	Ala	Ala	Leu	Ala	Ala	Lys	Glu	195
Ala	Gly	Leu	Arg	Leu	Glu	Glu	Thr	Ala	Gly	Glu	Gly	Val	Leu	Arg	Ala	210
Leu	Glu	Ala	Ser	Arg	Ala	Glu	Glu	Arg	Glu	Arg	Gly	Gln	Thr	Leu	Val	225
Gly	Pro	His	Arg	Asp	Asp	Leu	Val	Phe	Leu	Leu	Glu	Gly	Arg	Pro	Ala	245
His	Arg	Phe	Ala	Ser	Arg	Gly	Glu	Ala	Lys	Thr	Leu	Ala	Leu	Ala	Leu	260
Arg	Leu	Ala	Glu	His	Arg	Leu	Leu	Gly	Glu	His	His	Gly	Glu	Pro	Pro	275
Leu	Leu	Leu	Val	Asp	Glu	Trp	Gly	Glu	Glu	Leu	Asp	Glu	Ala	Arg	Arg	290
Arg	Ala	Val	Leu	Ala	Tyr	Ala	Gln	Ala	Leu	Pro	Gln	Ala	Ile	Leu	Ala	305
Gly	Leu	Glu	Ala	Pro	Pro	Gly	Val	Pro	Val	Cys	Ser	Val	Val	Arg	Gly	325

Val Val Leu Cys Pro Gly Ala  
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<211> 2934  
<212> DNA  
<213> *Thermus thermophilus*

<220>  
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<222> (1).. (2934)

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Met Glu Ile Ala Leu Glu Arg Ile Tyr Gly His Arg Leu Ala Leu Pro  
1 5 10 15  
cag gtg ggg gcg gcc ttg ctt ttc gcc cag gag gcc ccc ccg gcc ctc 96  
Gln Val Gly Ala Ala Leu Leu Phe Ala Gln Glu Ala Pro Pro Ala Leu  
20 25 30  
ctc ctc gtc ccc gag gcg cgg ctt agg cgc tac cgg gac ctc tcc gcc 144  
Leu Leu Val Pro Glu Ala Arg Leu Arg Arg Tyr Arg Asp Leu Ser Ala  
35 40 45  
ttc ggg gcc aag gtc tac gtg aac ccc ggc ctc gag gcc ctg gag gaa 192  
Phe Gly Ala Lys Val Tyr Val Asn Pro Gly Leu Glu Ala Leu Glu Glu  
50 55 60  
aaa gcc ctc ttc gtc ctc tcc tac gag gag gcc cta agc ccc ttc ccc 240  
Lys Ala Leu Phe Val Leu Ser Tyr Glu Glu Ala Leu Ser Pro Phe Pro  
65 70 75 80  
gag gac cct gag gcc tgg cgg ctt ctt ctg gag gtg ggc cgc gcc tac 288  
Glu Asp Pro Glu Ala Trp Arg Leu Leu Leu Glu Val Gly Arg Ala Tyr  
85 90 95  
ccc cgg gag gcc ctc ctc tcc cgc ctc ctc aag ctg ggc tac gcc cgg 336  
Pro Arg Glu Ala Leu Leu Ser Arg Leu Leu Lys Leu Gly Tyr Ala Arg  
100 105 110  
gac gag gac tac cgc gtc ctg ggg gag gtg gtg gag ctc ggc gag gtg 384  
Asp Glu Asp Tyr Arg Val Leu Gly Glu Val Val Glu Leu Gly Glu Val  
115 120 125  
cgc ctg gag ttc ttc ggg gac gag ctg gaa agg ctt gtg gtc cgg ggg 432  
Arg Leu Glu Phe Phe Gly Asp Glu Leu Glu Arg Leu Val Val Arg Gly  
130 135 140

gag gaa agg cgg cgc cac gtc ctt ctg ccc aag ccg ggg aag cgc gag	480
Glu Glu Arg Arg Arg His Val Leu Leu Pro Lys Pro Gly Lys Ala Glu	
145 150 155 160	
ggc ttc acc tcc aag aag gtc ctc cac ttc cct ggc ccc gtc tac ctg	528
Gly Phe Thr Ser Lys Lys Val Leu His Phe Pro Gly Pro Val Tyr Leu	
165 170 175	
gac acc ccc gcc ctc gcc ccc aag gcc ctt tgg ccc ctc ctc gcg gga	576
Asp Thr Pro Ala Leu Ala Pro Lys Ala Leu Trp Pro Leu Leu Ala Gly	
180 185 190	
agg ccc tgg gtg gcc ctg ggc ggc ggg gtg gag ctc ccc ccc ttg gag	624
Arg Pro Trp Val Ala Leu Gly Gly Gly Val Glu Leu Pro Leu Glu	
195 200 205	
ctc ggg cgc agg ccc ctt cct cct tac cgg gga agc ctg aag gcc ctg	672
Leu Gly Ala Arg Pro Leu Pro Pro Tyr Arg Gly Ser Leu Lys Ala Leu	
210 215 220	
gaa aag gac ctc gcc cgc tgg ctt gcc gag ggg aag cgg gtc cac ctc	720
Glu Lys Asp Leu Ala Arg Trp Leu Ala Glu Gly Lys Arg Val His Leu	
225 230 235 240	
ttc gtg ggc cac gcc cgc acc ttg gag tac ctc aaa agg cgc ctc cag	768
Phe Val Gly His Ala Arg Thr Leu Glu Tyr Leu Lys Arg Arg Leu Gln	
245 250 255	
gcc ttc tgg ccc ctc atc ctg gac cgc ttc ccc ggc ccc aag ggg cgg	816
Ala Phe Ser Pro Leu Ile Leu Asp Arg Phe Pro Gly Pro Lys Gly Arg	
260 265 270	
ctt gcc ctc ctc ccc ggg gac ttt gag ggc ggg cgc gag tgg gga gag	864
Leu Ala Leu Leu Pro Gly Asp Phe Glu Gly Gly Ala Glu Trp Gly Glu	
275 280 285	
tgg gtc ctc ctc acc gag gcc ctg gtc ttc gcc acc ggg ggg gtg cgg	912
Trp Val Leu Leu Thr Glu Ala Leu Val Phe Ala Thr Gly Gly Val Arg	
290 295 300	
gcc agg gtc cgg gla ggg gag ggg ctc agc gac ccc ggg gcc ctt tcc	960
Ala Arg Val Arg Val Gly Glu Gly Leu Ser Asp Pro Gly Ala Leu Ser	
305 310 315 320	
cca ggg gac tac ctc atc cac ccg gag cac ggc gtc ggg cag tac ctg	1008
Pro Gly Asp Tyr Leu Ile His Pro Glu His Gly Val Gly Gln Tyr Leu	
325 330 335	
ggc ctc gag acc cgg gag gtc ctg ggg gtc aag cgg gac tac ctg gtc	1056
Gly Leu Glu Thr Arg Glu Val Leu Gly Val Lys Arg Asp Tyr Leu Val	
340 345 350	

ctg cgc tac aag ggg gaa ggg aag ctc tac ctc ccc gtg gag cag ctt	1104
Leu Arg Tyr Lys Gly Glu Gly Lys Leu Tyr Leu Pro Val Glu Gln Leu	
355 360 365	
ccc ctc ctc aag cgc cac ccc ggg acc acc gac gac ccc ccg gag ctt	1152
Pro Leu Leu Lys Arg His Pro Gly Thr Thr Asp Asp Pro Pro Glu Leu	
370 375 380	
tcc tcc ctg ggc aag aac gag tgg caa agg gcc aag gag cgg cgc cgg	1200
Ser Ser Leu Gly Lys Asn Glu Trp Gln Arg Ala Lys Glu Arg Ala Arg	
385 390 395 400	
aag gac gtg gag gag ctg gct ggg cgc ctc ctc gtc ctc cag gcc aag	1248
Lys Asp Val Glu Glu Leu Ala Gly Arg Leu Leu Val Leu Gln Ala Lys	
405 410 415	
cgc aag gcc acc ccg ggc cgg gcc ttt ccc cct ttg ccc gag tgg gat	1296
Arg Lys Ala Thr Pro Gly Arg Ala Phe Pro Pro Leu Pro Glu Trp Asp	
420 425 430	
cct ctg gtg gag aag ggg ttc ccc tac gag ctc acc ccc gac cag aag	1344
Pro Leu Val Glu Lys Gly Phe Pro Tyr Glu Leu Thr Pro Asp Gln Lys	
435 440 445	
cgg gcc ctg gag gag gtc ctc cgc gac ctg gaa agc ccc cac ccc atg	1392
Arg Ala Leu Glu Glu Val Leu Arg Asp Leu Glu Ser Pro His Pro Met	
450 455 460	
gac cgc ctg gtc tcg ggg gac gtg ggc ttc ggc aag acg gag gtg gcc	1440
Asp Arg Leu Val Ser Gly Asp Val Gly Phe Gly Lys Thr Glu Val Ala	
465 470 475 480	
ctg agg gcc gcc cac cgg gtg gtc ggg cac ggg gcc cag gtg gcc ttc	1488
Leu Arg Ala Ala His Arg Val Val Gly His Gly Ala Gln Val Ala Phe	
485 490 495	
ctg ggg cca acc acc ctc ctc gcc gag cag cac ggg aag acc ttt agg	1536
Leu Gly Pro Thr Thr Leu Leu Ala Glu Gln His Gly Lys Thr Phe Arg	
500 505 510	
gag cgc ttc cag ggg ctt ccc gtg agg gtt gcg gtc ctc tcc cgc ttc	1584
Glu Arg Phe Gln Gly Leu Pro Val Arg Val Ala Val Leu Ser Arg Phe	
515 520 525	
acc ccg ccc aag gag gag gag gcc atc cta aaa gcc ctc gcc gag ggg	1632
Thr Pro Pro Lys Glu Glu Glu Ala Ile Leu Lys Gly Leu Ala Glu Gly	
530 535 540	
acg gtg gac atc gtc atc ggc acc cac cgc ctc ctc cag gag gac gtg	1680
Thr Val Asp Ile Val Ile Gly Thr His Arg Leu Leu Gln Glu Asp Val	



545	550	555	560	
cgc ttc agg gac ctc ggc ctc ctc atc glg gac gag gag cac cgc ttc				1728
Arg Phe Arg Asp Leu Gly Leu Leu Ile Val Asp Glu Glu His Arg Phe	565	570	575	
ggc glg gcc caa aag gag agg atc cgg gag ctc aag gcg gag glg gac				1776
Gly Val Ala Gln Lys Glu Arg Ile Arg Glu Leu Lys Ala Glu Val Asp	580	585	590	
acc ctc tac ctc tcc gcc acc ccc atc ccc cgc acc ctc tac tcc gcc				1824
Thr Leu Tyr Leu Ser Ala Thr Pro Ile Pro Arg Thr Leu Tyr Ser Ala	595	600	605	
cig glg ggc ctc aaa gac ctt tcc agc atc cag acc cgg ccc cgg ggg				1872
Leu Val Gly Leu Lys Asp Leu Ser Ser Ile Gln Thr Pro Pro Pro Gly	610	615	620	
cgc aag ccc atc aag acc ttc ctc gct ccc ttt gal ccc ctc ttg glg				1920
Arg Lys Pro Ile Lys Thr Phe Leu Ala Pro Phe Asp Pro Leu Leu Val	625	630	635	640
cgg gag gcc atc ctc ttt gag ctg gag cgt ggg ggc aag gtc ttc tac				1968
Arg Glu Ala Ile Leu Phe Glu Leu Glu Arg Gly Gly Lys Val Phe Tyr	645	650	655	
gtc cac gac cgg glg gcc tcc ata gag gcc agg cgg cgc ttt ctg gaa				2016
Val His Asp Arg Val Ala Ser Ile Glu Ala Arg Arg Arg Phe Leu Glu	660	665	670	
aac ctc gtc ccc gag gcc cgc atc ggg glg gtc cac ggc cag atg ccc				2064
Asn Leu Val Pro Glu Ala Arg Ile Gly Val Val His Gly Gln Met Pro	675	680	685	
gaa agc ctc att gag gag acc atg ctc ctc ttc gcc gaa ggg gcg tac				2112
Glu Ser Leu Ile Glu Glu Thr Met Leu Leu Phe Ala Glu Gly Ala Tyr	690	695	700	
gac gtc ctc ctc gcc acc acc atc att gag gcg ggc ctg gac glg ccc				2160
Asp Val Leu Leu Ala Thr Thr Ile Ile Glu Ala Gly Leu Asp Val Pro	705	710	715	720
gag gcg aac acc atc ctc att gag cgg gcg gac cgc ctg ggc ctc gcc				2208
Glu Ala Asn Thr Ile Leu Ile Glu Arg Ala Asp Arg Leu Gly Leu Ala	725	730	735	
acc ttg tac cag ctc cgg ggc cgg glg ggg cgg agg gag gag gag gcc				2256
Thr Leu Tyr Gln Leu Arg Gly Arg Val Gly Arg Arg Glu Glu Glu Ala	740	745	750	
tac gcc tac ctc ttc cac cgg cct cgc ctc acc gag gcc gcg gag aag				2304

Tyr Ala Tyr Leu Phe His Pro Pro Arg Leu Thr Glu Ala Ala Glu Lys	
755	760
765	
cg ctc gcc gcc atc gcc gac ctc tcc gat ctg gcc tgg gcc cac ctc	2352
Arg Leu Ala Ala Ile Ala Asp Leu Ser Asp Leu Gly Ser Gly His Leu	
770	775
780	
ctg gcc gaa agg gac atg gaa atc cgg gcc gtg gcc aac ctt ttg ggg	2400
Leu Ala Glu Arg Asp Met Glu Ile Arg Gly Val Gly Asn Leu Leu Gly	
785	790
795	800
ccg gag cag cac ggg cac atc cgg cgg ctt tcc ctc gag gtc tac acc	2448
Pro Glu Gln His Gly His Ile Arg Ala Leu Ser Leu Glu Val Tyr Thr	
805	810
815	
gag ctt ctg gaa gag gcc atc cgc aag ctc aag ggg gag gcc aag gag	2496
Glu Leu Leu Glu Glu Ala Ile Arg Lys Leu Lys Gly Glu Ala Lys Glu	
820	825
830	
gag cgg cgg cac gtg acc ctg gac ctc gcc ctc tcc gcc cgg ctg ccc	2544
Glu Arg Arg His Val Thr Leu Asp Leu Ala Leu Ser Ala Arg Leu Pro	
835	840
845	
gcg gag tac gtg ggg agc ctc gag gcc agg agc cgc tac tac agc cgt	2592
Ala Glu Tyr Val Gly Ser Leu Glu Ala Arg Ser Arg Tyr Tyr Ser Arg	
850	855
860	
ttt gcc gag cgc aaa agc ctc gcc gag ctt tcc cgc ctg gtg cgg gag	2640
Phe Ala Glu Ala Lys Ser Leu Ala Glu Leu Ser Arg Leu Val Arg Glu	
865	870
875	880
ctc aaa gag cgc tac ggg ccc ctt cct gag gag cgc gag aac ttc gtg	2688
Leu Lys Glu Arg Tyr Gly Pro Leu Pro Glu Glu Ala Glu Asn Phe Val	
885	890
895	
gcc ctc gcc cgg ctc cgc ctg gtg cgc gag agg aag ggg gtg gtg tcc	2736
Ala Leu Ala Arg Leu Arg Leu Val Ala Glu Arg Lys Gly Val Val Ser	
900	905
910	
atc acg gag gcc ctc acc cac ctg gag gtg gtc ttc ccc cgc tac ccc	2784
Ile Thr Glu Gly Leu Thr His Leu Glu Val Val Phe Pro Arg Tyr Pro	
915	920
925	
ctg gac tac gac gcc cgc gcc ctc aag ggg ctt ccc tac cgg gtg gag	2832
Leu Asp Tyr Asp Ala Arg Gly Leu Lys Gly Leu Pro Tyr Arg Val Glu	
930	935
940	
ctt acg cag tac cgc ccc ggg ttc cgc ctg gag aag aag gcc ctg agg	2880
Leu Thr Gln Tyr Pro Pro Gly Phe Arg Leu Glu Lys Lys Gly Leu Arg	
945	950
955	960

ccc cgg gac tac ccc gag gcc ctg atg gag gtg ctc tac ctc ttc gcc 2928  
Pro Arg Asp Tyr Pro Glu Ala Leu Met Glu Val Leu Tyr Leu Phe Ala  
965 970 975

gac ctc 2934  
Asp Leu

<210> 8

<211> 978

<212> PRT

<213> *Thermus thermophilus*

<400> 8

Met Glu Ile Ala Leu Glu Arg Ile Tyr Gly His Arg Leu Ala Leu Pro  
1 5 10 15

Gln Val Gly Ala Ala Leu Leu Phe Ala Gln Glu Ala Pro Pro Ala Leu  
20 25 30

Leu Leu Val Pro Glu Ala Arg Leu Arg Arg Tyr Arg Asp Leu Ser Ala  
35 40 45

Phe Gly Ala Lys Val Tyr Val Asn Pro Gly Leu Glu Ala Leu Glu Glu  
50 55 60

Lys Ala Leu Phe Val Leu Ser Tyr Glu Glu Ala Leu Ser Pro Phe Pro  
65 70 75 80

Glu Asp Pro Glu Ala Trp Arg Leu Leu Leu Glu Val Gly Arg Ala Tyr  
85 90 95

Pro Arg Glu Ala Leu Leu Ser Arg Leu Leu Lys Leu Gly Tyr Ala Arg  
100 105 110

Asp Glu Asp Tyr Arg Val Leu Gly Glu Val Val Glu Leu Gly Glu Val  
115 120 125

Arg Leu Glu Phe Phe Gly Asp Glu Leu Glu Arg Leu Val Val Arg Gly  
130 135 140

Glu Glu Arg Arg Arg His Val Leu Leu Pro Lys Pro Gly Lys Ala Glu  
145 150 155 160

Gly Phe Thr Ser Lys Lys Val Leu His Phe Pro Gly Pro Val Tyr Leu  
165 170 175

Asp Thr Pro Ala Leu Ala Pro Lys Ala Leu Trp Pro Leu Leu Ala Gly  
180 185 190

Arg Pro Trp Val Ala Leu Gly Gly Gly Val Glu Leu Pro Pro Leu Glu

195	200	205
Leu Gly Ala Arg Pro Leu Pro Pro Tyr Arg Gly Ser Leu Lys Ala Leu 210 215 220		
Glu Lys Asp Leu Ala Arg Trp Leu Ala Glu Gly Lys Arg Val His Leu 225 230 235 240		
Phe Val Gly His Ala Arg Thr Leu Glu Tyr Leu Lys Arg Arg Leu Gln 245 250 255		
Ala Phe Ser Pro Leu Ile Leu Asp Arg Phe Pro Gly Pro Lys Gly Arg 260 265 270		
Leu Ala Leu Leu Pro Gly Asp Phe Glu Gly Gly Ala Glu Trp Gly Glu 275 280 285		
Trp Val Leu Leu Thr Glu Ala Leu Val Phe Ala Thr Gly Gly Val Arg 290 295 300		
Ala Arg Val Arg Val Gly Glu Gly Leu Ser Asp Pro Gly Ala Leu Ser 305 310 315 320		
Pro Gly Asp Tyr Leu Ile His Pro Glu His Gly Val Gly Gln Tyr Leu 325 330 335		
Gly Leu Glu Thr Arg Glu Val Leu Gly Val Lys Arg Asp Tyr Leu Val 340 345 350		
Leu Arg Tyr Lys Gly Glu Gly Lys Leu Tyr Leu Pro Val Glu Gln Leu 355 360 365		
Pro Leu Leu Lys Arg His Pro Gly Thr Thr Asp Asp Pro Pro Glu Leu 370 375 380		
Ser Ser Leu Gly Lys Asn Glu Trp Gln Arg Ala Lys Glu Arg Ala Arg 385 390 395 400		
Lys Asp Val Glu Glu Leu Ala Gly Arg Leu Leu Val Leu Gln Ala Lys 405 410 415		
Arg Lys Ala Thr Pro Gly Arg Ala Phe Pro Pro Leu Pro Glu Trp Asp 420 425 430		
Pro Leu Val Glu Lys Gly Phe Pro Tyr Glu Leu Thr Pro Asp Gln Lys 435 440 445		
Arg Ala Leu Glu Glu Val Leu Arg Asp Leu Glu Ser Pro His Pro Met 450 455 460		
Asp Arg Leu Val Ser Gly Asp Val Gly Phe Gly Lys Thr Glu Val Ala		

Leu Arg Ala Ala His Arg Val Val Gly His Gly Ala Gln Val Ala Phe
465                  470                  475                  480 485                  490                  495
Leu Gly Pro Thr Thr Leu Leu Ala Glu Gln His Gly Lys Thr Phe Arg
500                  505                  510
Glu Arg Phe Gln Gly Leu Pro Val Arg Val Ala Val Leu Ser Arg Phe
515                  520                  525
Thr Pro Pro Lys Glu Glu Glu Ala Ile Leu Lys Gly Leu Ala Glu Gly
530                  535                  540
Thr Val Asp Ile Val Ile Gly Thr His Arg Leu Leu Gln Glu Asp Val
545                  550                  555                  560
Arg Phe Arg Asp Leu Gly Leu Leu Ile Val Asp Glu Glu His Arg Phe
565                  570                  575
Gly Val Ala Gln Lys Glu Arg Ile Arg Glu Leu Lys Ala Glu Val Asp
580                  585                  590
Thr Leu Tyr Leu Ser Ala Thr Pro Ile Pro Arg Thr Leu Tyr Ser Ala
595                  600                  605
Leu Val Gly Leu Lys Asp Leu Ser Ser Ile Gln Thr Pro Pro Pro Gly
610                  615                  620
Arg Lys Pro Ile Lys Thr Phe Leu Ala Pro Phe Asp Pro Leu Leu Val
625                  630                  635                  640
Arg Glu Ala Ile Leu Phe Glu Leu Glu Arg Gly Gly Lys Val Phe Tyr
645                  650                  655
Val His Asp Arg Val Ala Ser Ile Glu Ala Arg Arg Arg Phe Leu Glu
660                  665                  670
Asn Leu Val Pro Glu Ala Arg Ile Gly Val Val His Gly Gln Met Pro
675                  680                  685
Glu Ser Leu Ile Glu Glu Thr Met Leu Leu Phe Ala Glu Gly Ala Tyr
690                  695                  700
Asp Val Leu Leu Ala Thr Thr Ile Ile Glu Ala Gly Leu Asp Val Pro
705                  710                  715                  720
Glu Ala Asn Thr Ile Leu Ile Glu Arg Ala Asp Arg Leu Gly Leu Ala
725                  730                  735
Thr Leu Tyr Gln Leu Arg Gly Arg Val Gly Arg Arg Glu Glu Glu Ala

740	745	750
Tyr Ala Tyr Leu Phe His Pro Pro Arg Leu Thr Glu Ala Ala Glu Lys		
755	760	765
Arg Leu Ala Ala Ile Ala Asp Leu Ser Asp Leu Gly Ser Gly His Leu		
770	775	780
Leu Ala Glu Arg Asp Met Glu Ile Arg Gly Val Gly Asn Leu Leu Gly		
785	790	795
Pro Glu Gln His Gly His Ile Arg Ala Leu Ser Leu Glu Val Tyr Thr		
805	810	815
Glu Leu Leu Glu Glu Ala Ile Arg Lys Leu Lys Gly Glu Ala Lys Glu		
820	825	830
Glu Arg Arg His Val Thr Leu Asp Leu Ala Leu Ser Ala Arg Leu Pro		
835	840	845
Ala Glu Tyr Val Gly Ser Leu Glu Ala Arg Ser Arg Tyr Tyr Ser Arg		
850	855	860
Phe Ala Glu Ala Lys Ser Leu Ala Glu Leu Ser Arg Leu Val Arg Glu		
865	870	875
Leu Lys Glu Arg Tyr Gly Pro Leu Pro Glu Glu Ala Glu Asn Phe Val		
885	890	895
Ala Leu Ala Arg Leu Arg Leu Val Ala Glu Arg Lys Gly Val Val Ser		
900	905	910
Ile Thr Glu Gly Leu Thr His Leu Glu Val Val Phe Pro Arg Tyr Pro		
915	920	925
Leu Asp Tyr Asp Ala Arg Gly Leu Lys Gly Leu Pro Tyr Arg Val Glu		
930	935	940
Leu Thr Gln Tyr Pro Pro Gly Phe Arg Leu Glu Lys Lys Gly Leu Arg		
945	950	955
Pro Arg Asp Tyr Pro Glu Ala Leu Met Glu Val Leu Tyr Leu Phe Ala		
965	970	975

Asp Leu

<210> 9  
 <211> 38  
 <212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

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38

<210> 10

<211> 41

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 10

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41

<210> 11

<211> 31

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 11

atcatatgag agaccgggtc cgciggcggg t

31

<210> 12

<211> 32

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 12

atagatcttt acaggtccac cgcctggacc tc

32

<210> 13

<211> 49

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 13

actacttggt acactgacgc gagcacgcag gagctcaltc cagtgcgca 49

<210> 14

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 14

atatcataatg cgttctctcc ttctccggca acggaact 38

<210> 15

<211> 41

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 15

atatagatct ttattaggcg ccagggcaca ggaccacccc t 41

<210> 16

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 16

atatcataatg gaaatcgcg tagagaggat ctacggcc 38

<210> 17

<211> 41

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: synthetic DNA

<400> 17



atatagaict ttattagagg tcggcgaaga ggtagagcac c

41

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